



## PREVALENCE OF CANDIDEMIA IN A TEACHING TERTIARY CARE HOSPITAL IN HARYANA

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### ABSTRACT

**Introduction:** Incidence of candidemia has increased drastically in last few decades. *Candida albicans* had been the predominant species responsible till recently, which has now been surpassed by non albicans *Candida*.

**Material and methods:** Blood samples from 4480 patients were cultured on Sabouraud's Dextrose Agar (SDA) and colonies were identified by standard microbiological techniques.

**Results:** Candidemia was observed in 6.7% cases. The predominant *Candida* species isolated in our study was *C. albicans* (47%) followed by *C. tropicalis* (22.1%).

**Conclusion:** New *Candida* species continue to emerge which makes it imperative to speciate all isolates.

**KEYWORDS :** *Candida albicans*, non albicans candida, antifungal resistance, candidemia, immunocompromised

### INTRODUCTION:

Over the last few decades the incidence of candidemia has increased drastically with an increased morbidity and mortality rates.<sup>1</sup> According to literature, it is the fourth most common primary nosocomial blood stream pathogen with mortality ranging from 30-81%.<sup>2</sup> Until recently, *Candida albicans* had been the predominant species responsible for candidemia but there has been a progressive shift observed from *Candida albicans* to Non-albicans *Candida* (NAC) in the past decade. This has been attributed to injudicious use of azole agents resulting in the emergence of NAC species such as *Candida krusei* and *Candida glabrata* which are intrinsically resistant to azoles.<sup>3,4</sup>

The various risk factors responsible for candidemia include prolonged hospital stay, intravascular devices, broad spectrum antimicrobial treatment, use of cytotoxic drugs, and immunocompromised states like HIV and organ transplant recipients. Patients exposed to these multiple risk factors along with an increased survival rate of immunocompromised patients has led to the rise in rates of candidemia in recent years.<sup>5</sup> Nosocomial outbreak of candidemia has also been found to be associated with colonization of health care workers.<sup>6</sup>

It has thus become prudent to keep a high index of suspicion for early diagnosis and to speciate all isolates of *Candida* for appropriate and timely treatment. Hence, we designed this study to know the epidemiology of candidemia at our tertiary care centre, which would help clinician in initiating an appropriate treatment.

### Material and Methods:

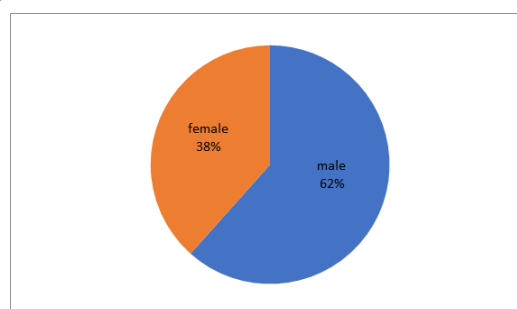
This retrospective study was conducted in the Department of Microbiology during six years period from June 2011- May 2017. A total of 4480 patients of all age groups and sex attending OPDs and admitted in wards with clinical suspicion of candidemia were enrolled in the study. Two consecutive blood samples from two different sides were collected aseptically from each patient and inoculated into two brain heart infusion (BHI) broths. The BHI broths were incubated at 37°C and 25°C respectively and subcultures on SDA and were observed upto 7 days. The colonies were identified by standard microbiological techniques. All *Candida* isolates were obtained and identified up-to the species level on the basis of germ

tube test, morphology on cornmeal agar, growth on Hi-Chrome *Candida* agar, carbohydrate fermentation and sugar assimilation test.<sup>7,8</sup>

### Results:

In the study period of 6 years, a total of 4480 samples for suspected candidemia were received in our laboratory. Of which, 302(6.7%) yielded *Candida* growth. Of the 302 *Candida* isolated, male to female ratio in our study was 1.6:1 as shown in Fig 1.

**Fig 1: Sex wise distribution of *Candida* isolates**

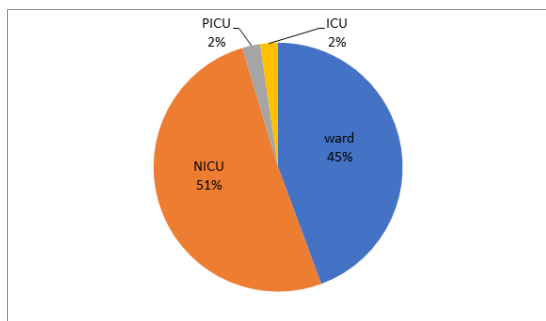


Maximum number of *Candida* isolates were received from newborn admitted in neonatal ICU as described in Table 1 and Fig 2. The predominant *Candida* species isolated in our study was *C. albicans* (47%) followed by *C. tropicalis* (22.1%). Table 2 shows the different isolates of *Candida* in our study.

**Table 1: Age wise distribution of *Candida* species**

Age group	Number (%)
Neonate	254(84.1)
Infant	4(1.3)
1-10 years	8(2.6)
11-20years	3(0.99)
21-30 years	8(2.6)
31-40years	7(2.3)
41-50 years	4(1.3)
51-60 years	10(3.3)
>60 years	4(1.3)

**Fig 2: Distribution of isolates according to clinical settings**



**Table 2: Distribution of various *Candida* species in our setup**

Species of <i>Candida</i>	Number of isolates (N=302)	Percentage of isolates (%)
<i>Candida albicans</i>	142	47
<i>Candida tropicalis</i>	67	22.18
<i>Candida krusei</i>	52	17.21
<i>Candida glabrata</i>	28	9.3
<i>Candida parapsilosis</i>	9	2.9
<i>Candida pelliculosa</i>	3	0.9
<i>Candida guilliermondii</i>	1	0.3

**Discussion:**

Candidemia in critically ill patients is associated with prolonged duration of hospital stay, excessive expenditure in medical care resulting in an increased burden on health care settings. In our study, the rate of candidemia was found to be 6.7%, which is similar to various other studies done in India.<sup>9,10</sup> Certain studies done abroad have shown variable rates of candidemia ranging from 1.4%-15%.<sup>11,12,13,14</sup> Varied rates of candidemia in these studies could be due to the different geographical locations and due to injudicious use of antibiotics. Different studies have included different group of patients with varied risk factors which could also be responsible for different rates of candidemia. Immunocompromised patients and extremes of age groups are prone for *Candida* infections. In our study, out of 302 *Candida* isolated, 254 (%) were neonates, which is similar to another study done in neonates.<sup>15</sup> Amongst neonates, 9-13% of blood stream infections have been attributed to *Candida* spp.<sup>16</sup>

Historically, *Candida albicans* was the most common species isolated from BSI, but recently a progressive shift towards non albicans *Candida* spp has been reported. In the present study, *Candida albicans* continues to be the predominant species with 47%. Amongst the non albicans *Candida* spp, *C. tropicalis* was the commonest isolate which corroborates well with results of various studies done elsewhere.<sup>17,18</sup> *C. tropicalis* has been found to be responsible for higher mortality rates as compared to other *Candida* spp.<sup>19</sup>

Resistant species like *C. krusei* and *C. glabrata* in our study were 28.51% which may be responsible for treatment failure. Henceforth the speciation of all *Candida* isolates becomes mandatory. A relatively new species in our study was *C. pelliculosa* (0.9%) which has been very infrequently reported from India. Although, there have been nosocomial outbreaks amongst neonates reported outside India.<sup>20,21</sup> Spectrum of newly reported species amongst *Candida* isolates continues to expand which has been contributing to the changing pattern of bloodstream infections. Hence newer detection methods for the speciation of *Candida* becomes the need of the hour.

**Conclusion:** We conclude that *C. albicans* remains as the major fungal pathogen causing blood stream infections. However, new *Candida* species continue to emerge which makes it imperative to speciate all isolates. Results of our study can be extrapolated to

serve as template for reducing the morbidity and mortality due to candidemia in our setup.

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